



US011583467B2

(12) **United States Patent**
Kodama

(10) **Patent No.: US 11,583,467 B2**
(45) **Date of Patent: Feb. 21, 2023**

(54) **CHAIR-TYPE MASSAGE MACHINE**

(56) **References Cited**

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U.S. PATENT DOCUMENTS

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 479 days.

4,576,149 A * 3/1986 Otuka A61H 15/00
601/99
4,759,584 A * 7/1988 Dykstra B60N 3/102
297/188.16
5,076,524 A * 12/1991 Reh B60N 2/79
297/217.3 X
5,195,709 A * 3/1993 Yasushi B64D 11/0646
297/217.3 X
5,374,104 A * 12/1994 Moore B64D 11/00153
297/188.16 X
6,007,036 A * 12/1999 Rosen B64D 11/0627
297/217.3
6,039,702 A * 3/2000 Cutler A61H 23/0263
601/57
6,117,094 A * 9/2000 Fujii A61H 39/04
601/102

(21) Appl. No.: **16/801,317**

(22) Filed: **Feb. 26, 2020**

(65) **Prior Publication Data**

US 2020/0405569 A1 Dec. 31, 2020

(Continued)

FOREIGN PATENT DOCUMENTS

(30) **Foreign Application Priority Data**

JP 2017-140275 A 8/2017

Jun. 28, 2019 (JP) JP2019-121108

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(51) **Int. Cl.**

A47C 7/62 (2006.01)

A61H 7/00 (2006.01)

A47C 1/022 (2006.01)

A47C 31/00 (2006.01)

G06F 3/0482 (2013.01)

(57)

ABSTRACT

A chair-type massage machine includes a main body on which a person to be treated is to be seated, a holding part at least part of which is placed inside a container recess to hold a first operation unit, and a moving mechanism for moving the holding part. The holding part is reciprocatably moved between a first position in which the first operation unit is contained in the container recess and a second position in which the first operation unit is exposed. The chair-type massage machine further includes a second operation unit for moving the holding part.

(52) **U.S. Cl.**

CPC **A61H 7/00** (2013.01); **A47C 1/022**
(2013.01); **A47C 31/008** (2013.01); **G06F**
3/0482 (2013.01); **A61H 2201/0149** (2013.01);
A61H 2201/0161 (2013.01); **A61H 2201/5028**
(2013.01)

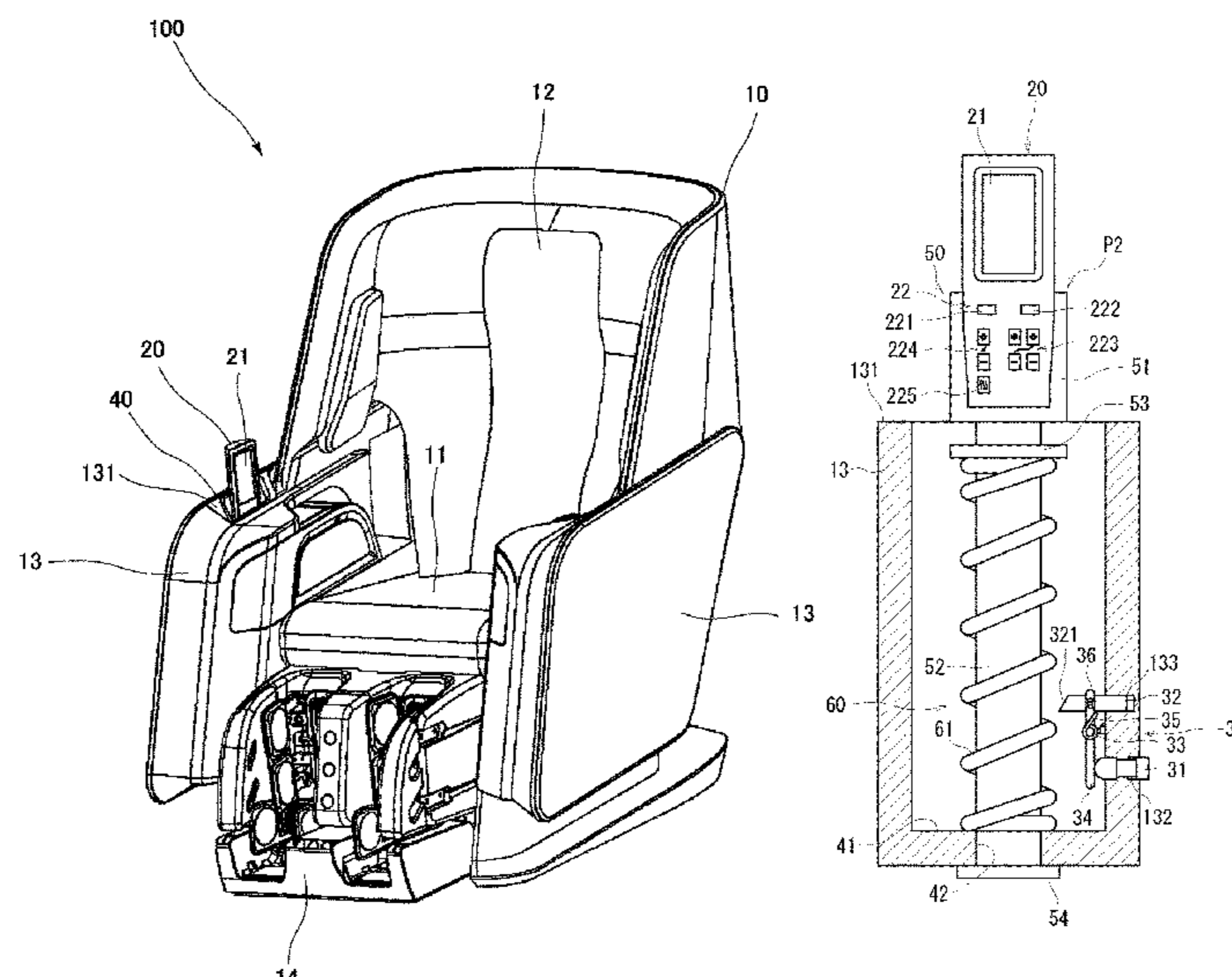
(58) **Field of Classification Search**

CPC **A47C 31/008**; **A61H 2201/0149**; **G06F**
3/0482

USPC 297/188.16, 145, 217.3–217.5

See application file for complete search history.

5 Claims, 10 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

6,171,266 B1 *

1/2001

Inada

A61H 23/00

601/102

6,517,500 B2 *

2/2003

Ichikawa

A61H 9/0078

601/97

6,592,533 B1 *

7/2003

Yonekawa

A47C 4/54

601/49

7,189,211 B2 *

3/2007

Inada

A61H 23/0254

601/99

7,195,604 B2 *

3/2007

Nakamura

A61H 23/04

601/149

7,241,271 B2 *

7/2007

Kurata

A61H 1/0266

601/34

7,261,266 B2 *

8/2007

Satterfield

B64D 11/00153

297/217.3

7,293,839 B2 *

11/2007

Shimizu

A61H 7/004

297/423.35

8,083,700 B2 *

12/2011

Tanizawa

A61H 23/04

601/151

8,827,938 B2 *

9/2014

Fukuyama

A47C 3/02

601/102

9,377,870 B2 *

6/2016

Kim

G06F 3/0236

9,715,822 B2 *

7/2017

Hille

A47C 20/041

9,813,239 B2 *

11/2017

Chee

G16H 20/30

10,663,730 B2 *

5/2020

Jung

G16H 30/20

10,966,901 B2 *

4/2021

Masuda

G06F 1/163

11,103,673 B2 *

8/2021

Bae

A61H 15/00

11,278,466 B2 *

3/2022

Yoshida

A61H 7/007

2007/0273180 A1 *

11/2007

Tanizawa

A61H 1/0274

297/85 M

2007/0273187 A1 *

11/2007

Tanizawa

A61H 15/0078

297/217.3

2008/0030053 A1 *

2/2008

Kamba

A61H 1/003

297/217.3 X

2008/0185888 A1 *

8/2008

Beall

A47C 7/723

297/217.3 X

2010/0320819 A1 *

12/2010

Cohen

A61H 23/0236

297/217.3 X

2011/0077563 A1 *

3/2011

Fukuyama

A47C 3/02

601/98

2013/0088059 A1 *

4/2013

Nagamitsu

A61H 1/003

297/260.1

2016/0113835 A1 *

4/2016

Tan

A61H 23/006

601/116

2016/0374885 A1 *

12/2016

Tan

A61H 1/008

601/134

2019/0183722 A1 *

6/2019

Le

A47C 1/00

2019/0290533 A1 *

9/2019

Le

A47C 1/00

2020/0197255 A1 *

6/2020

Bae

A47C 31/126

2020/0281359 A1 *

9/2020

Fukunaga

A47C 31/008

2020/0397644 A1 *

12/2020

Jung

A61H 1/00

2022/0183922 A1 *

6/2022

Le

A61H 39/08

* cited by examiner

Fig.1

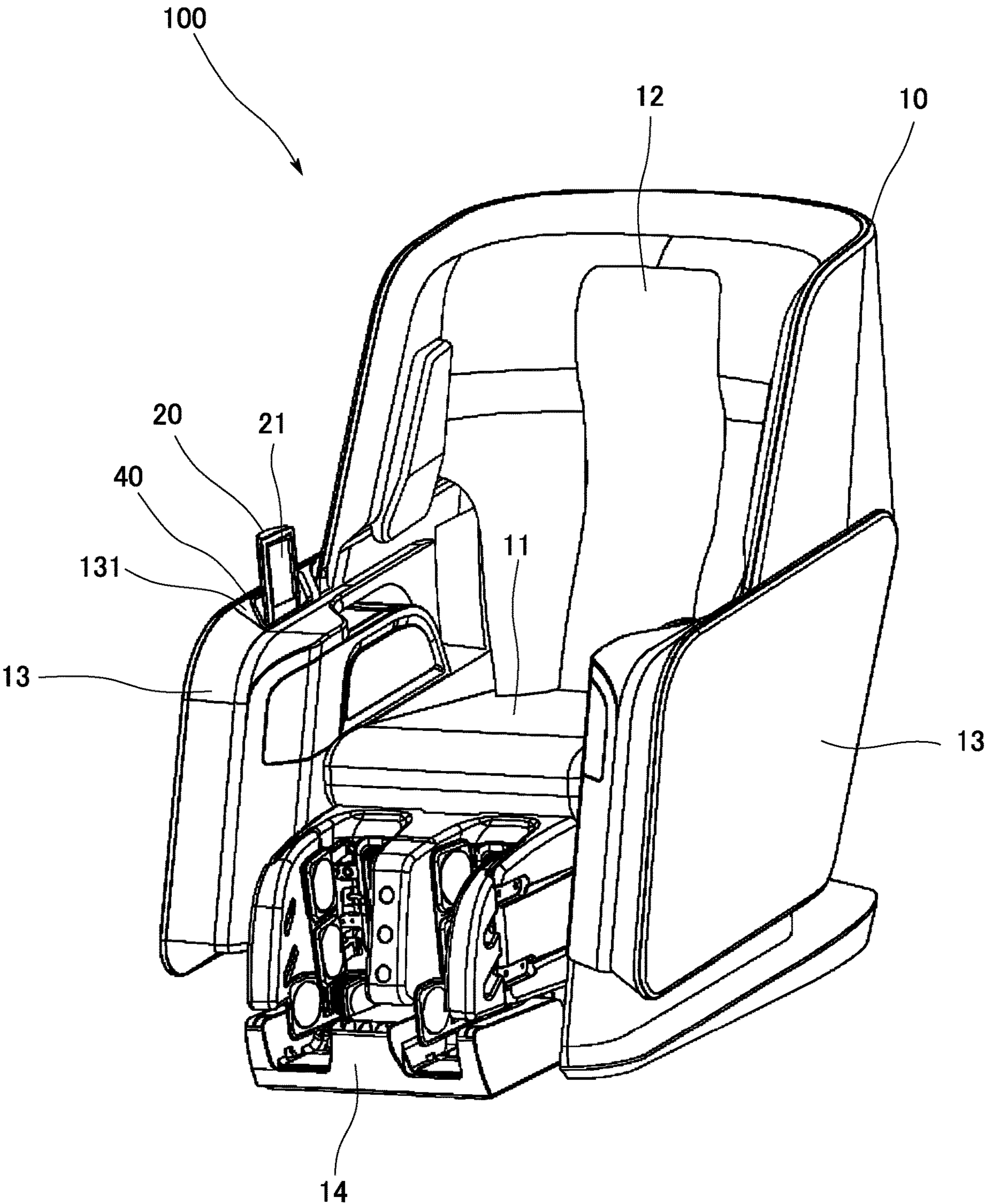


Fig. 2

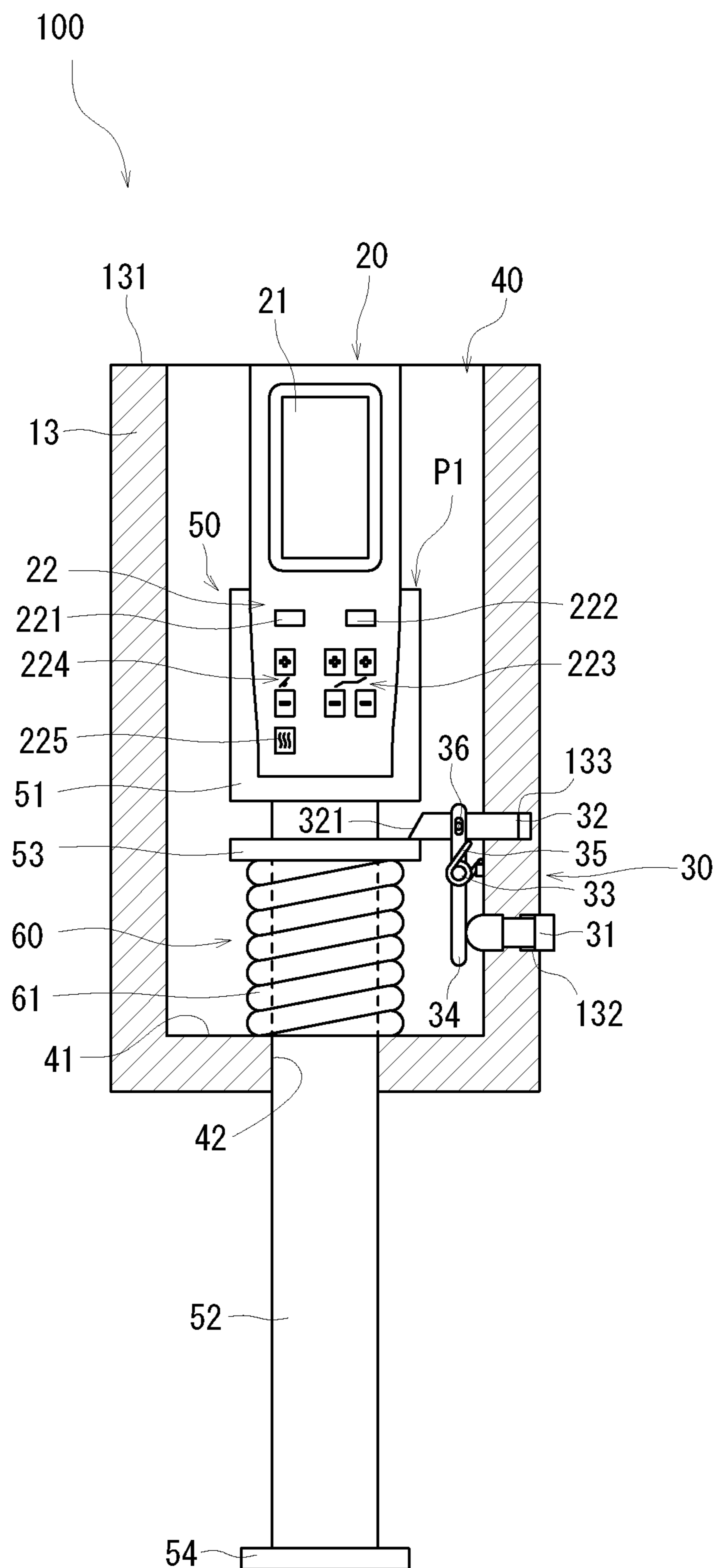


Fig. 3

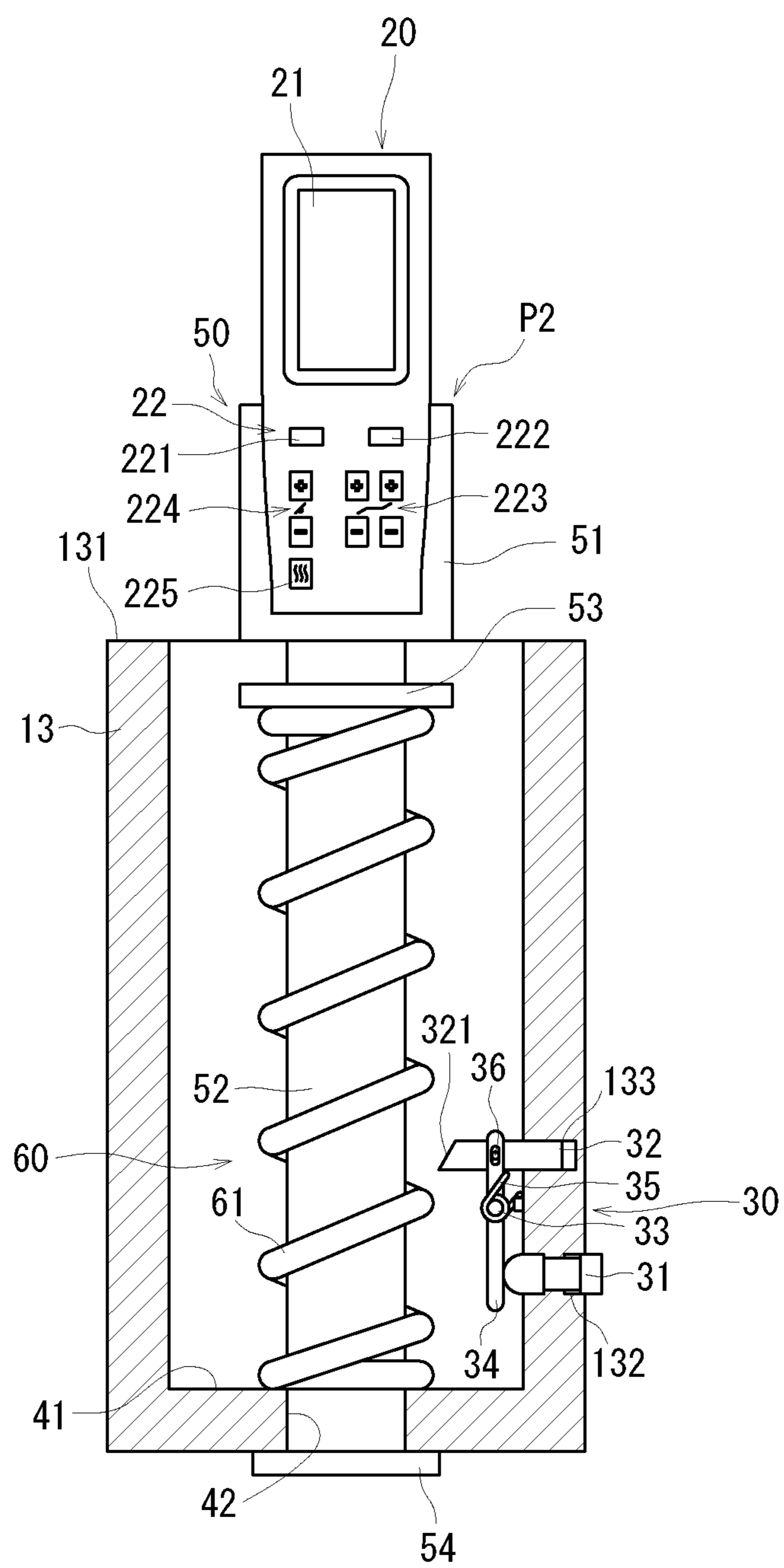


Fig. 4

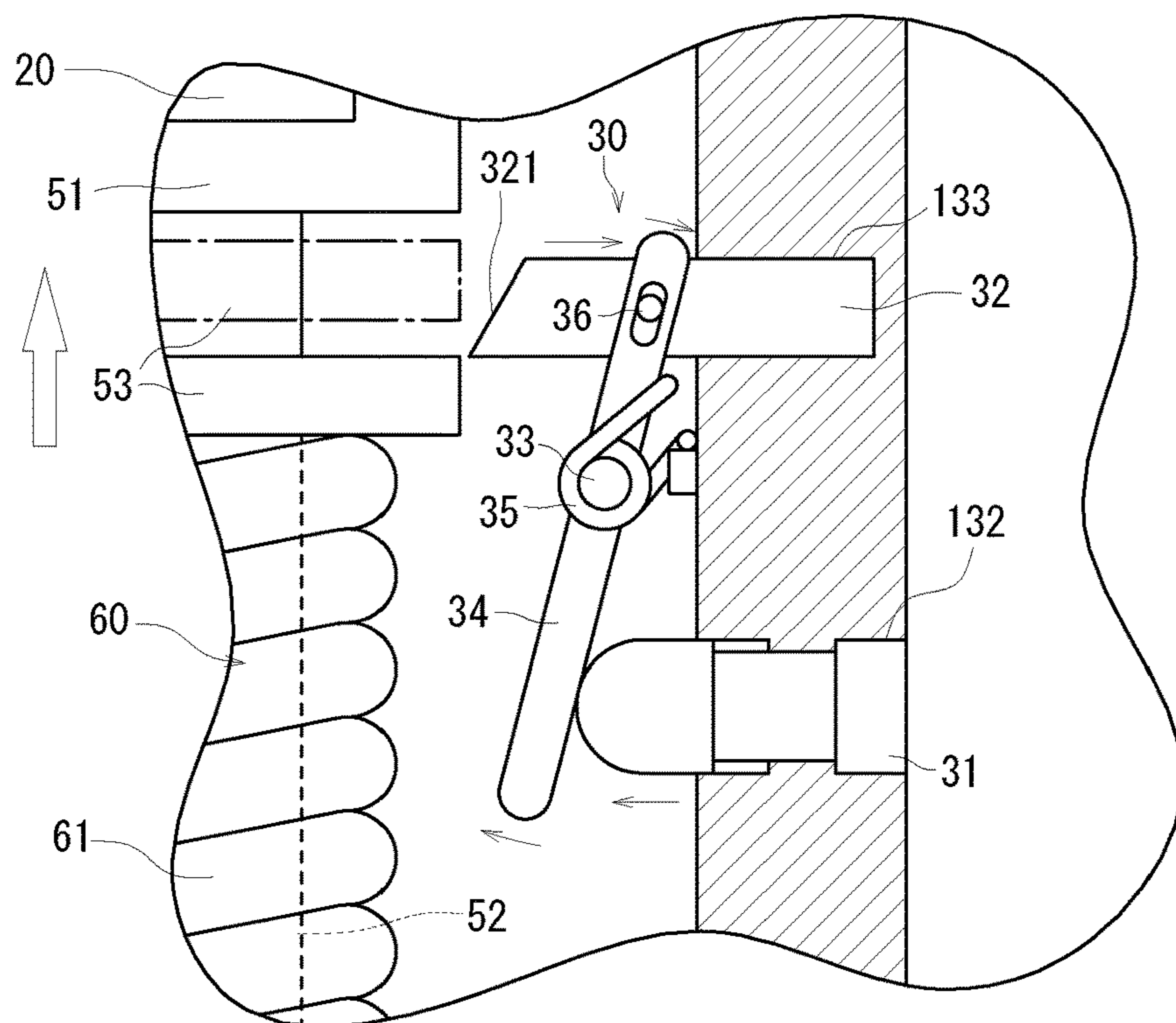


Fig. 5

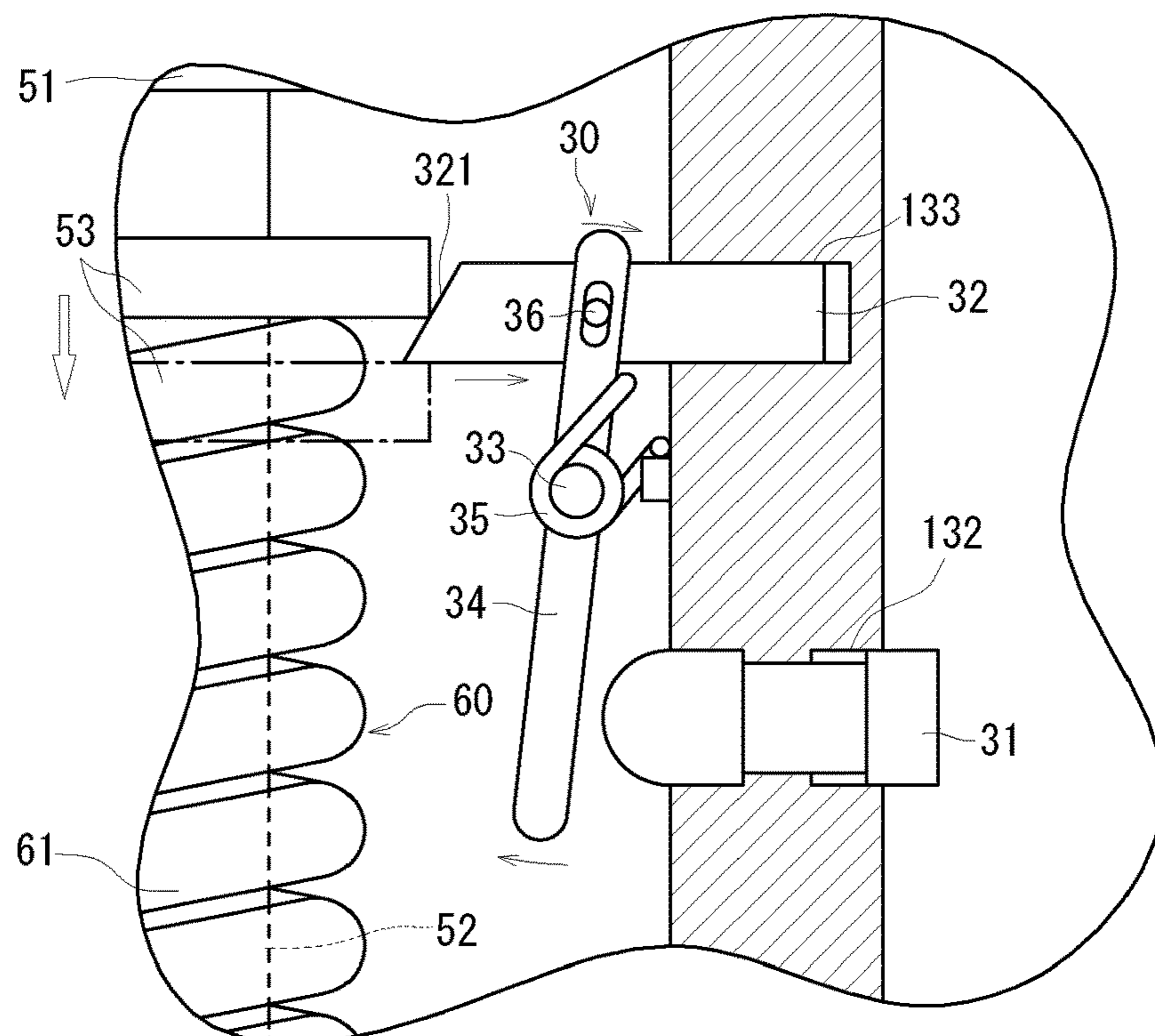


Fig. 6

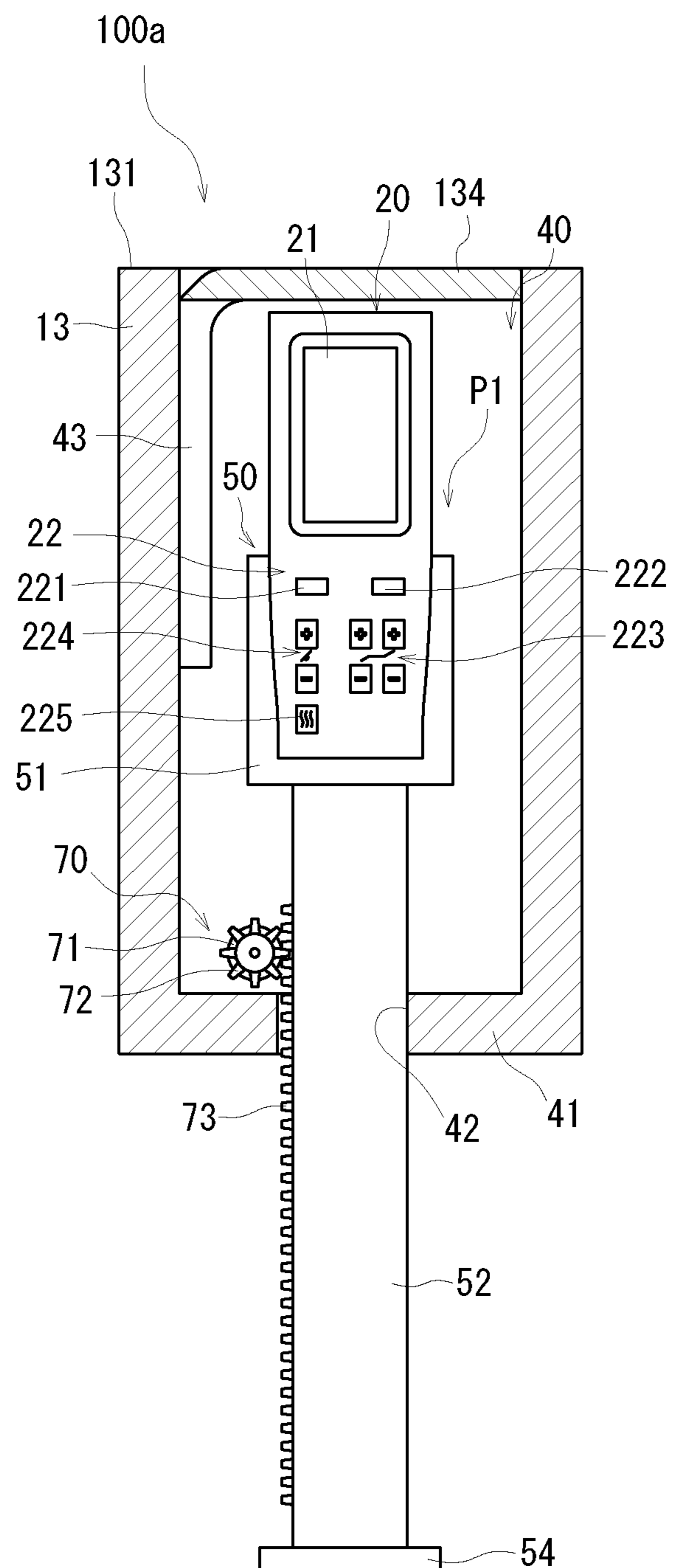


Fig. 7

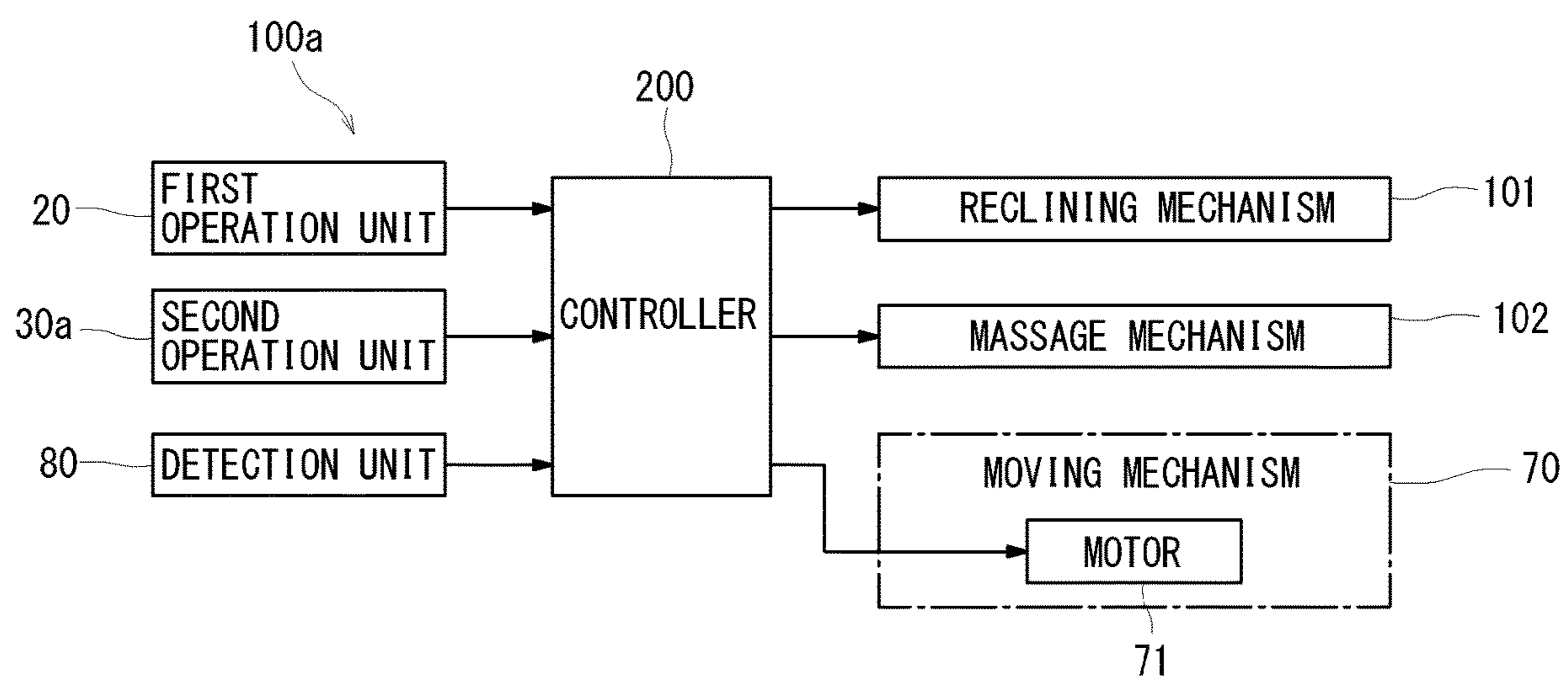


Fig. 8

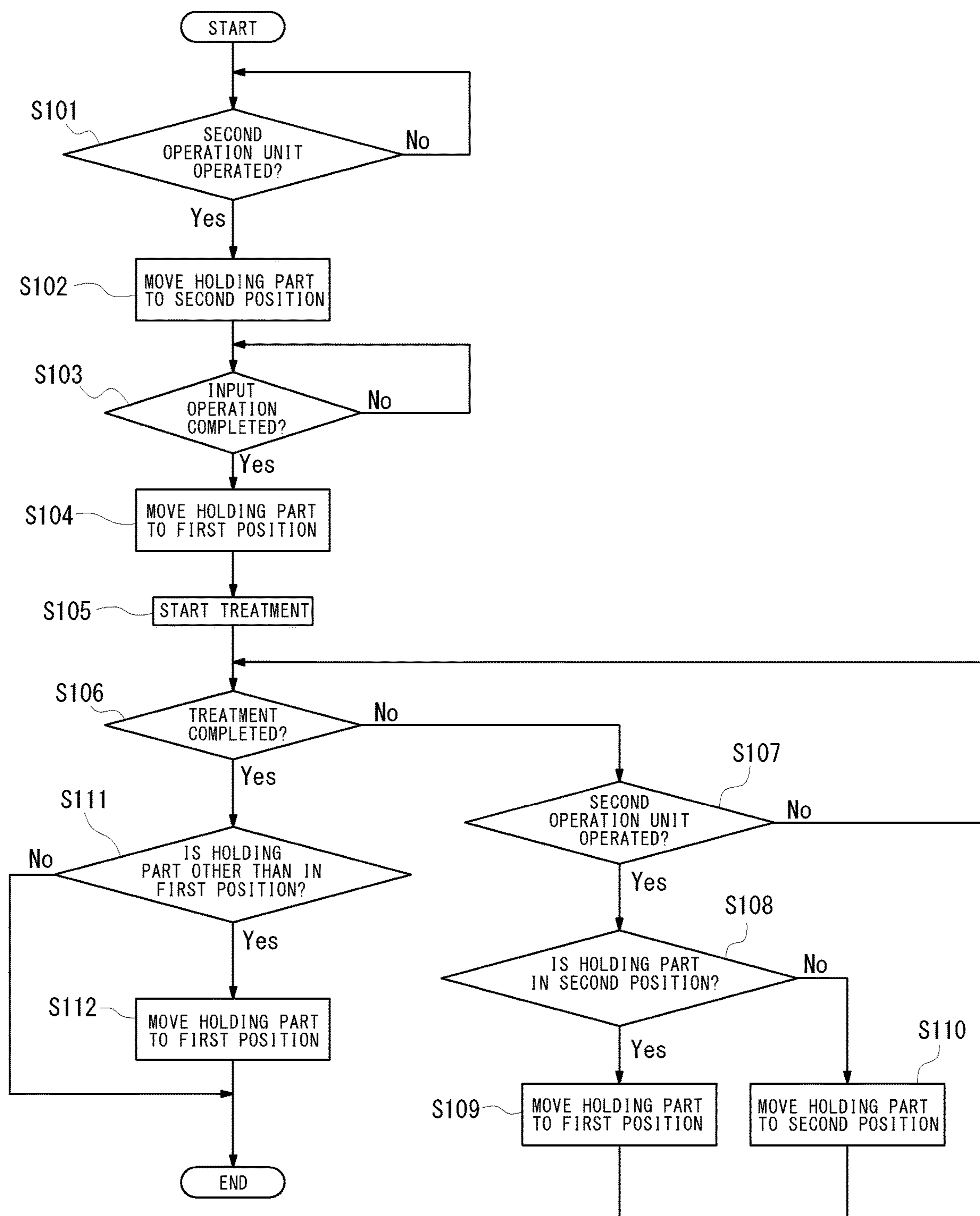


Fig. 9

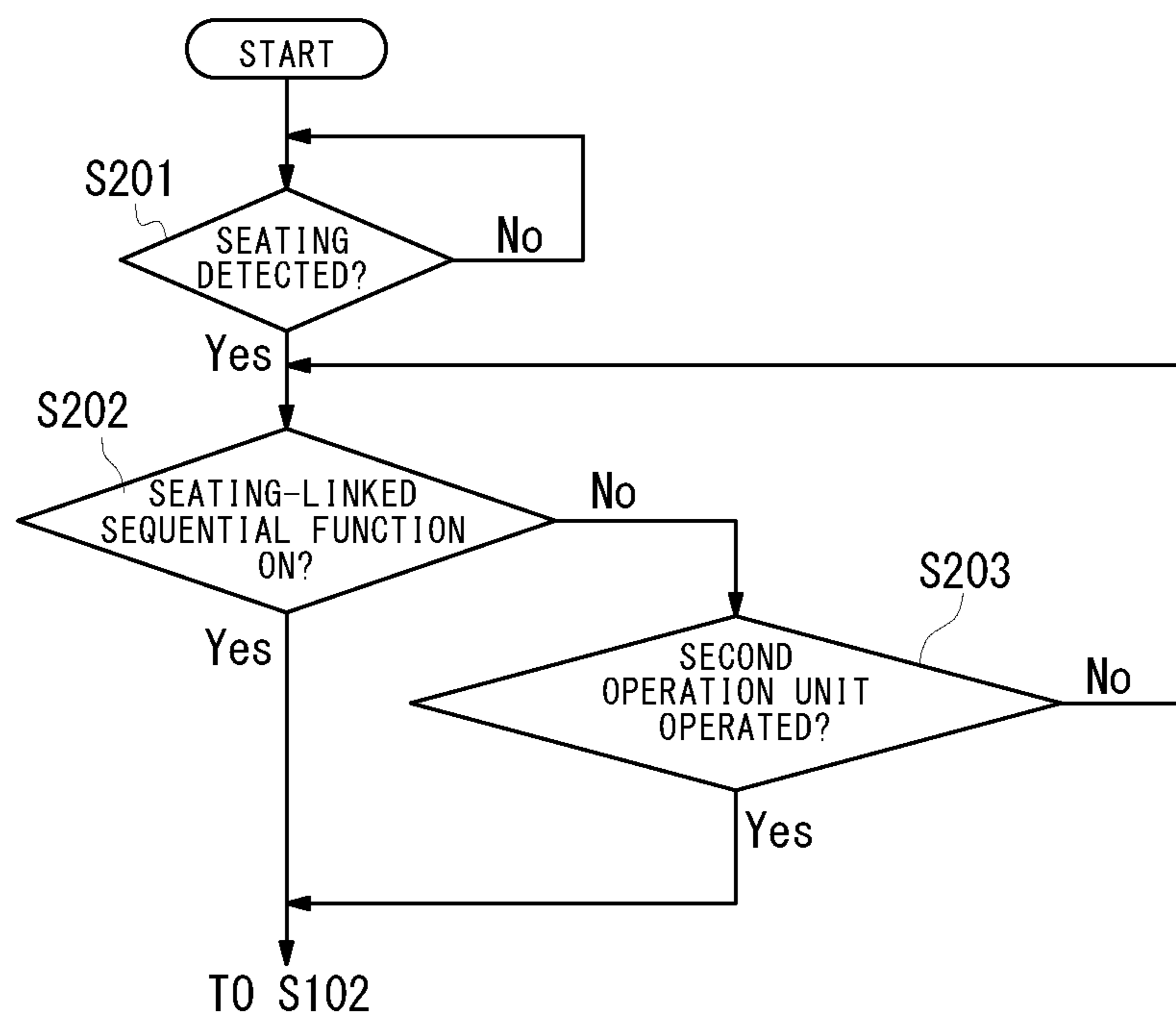


Fig. 10

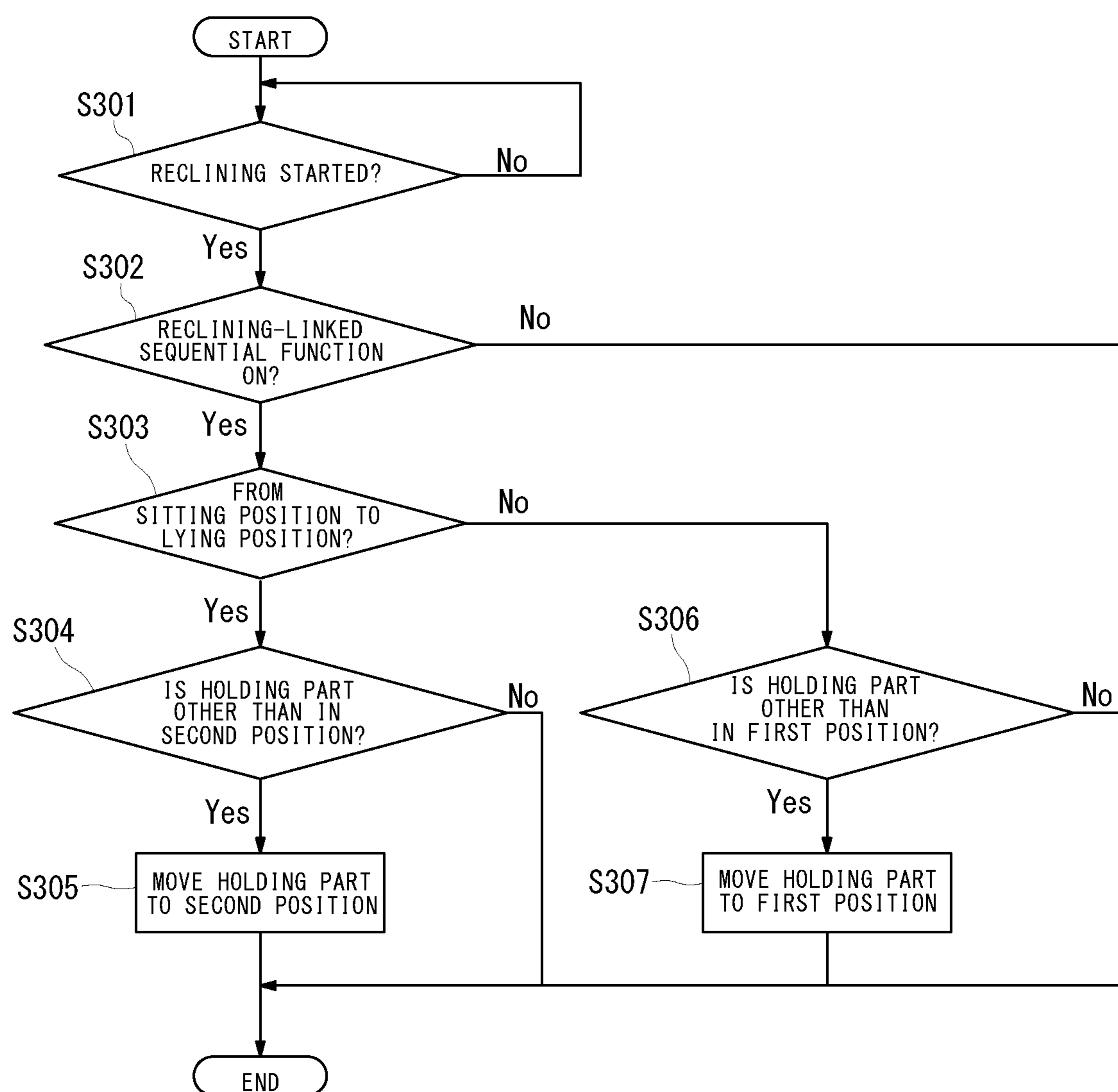
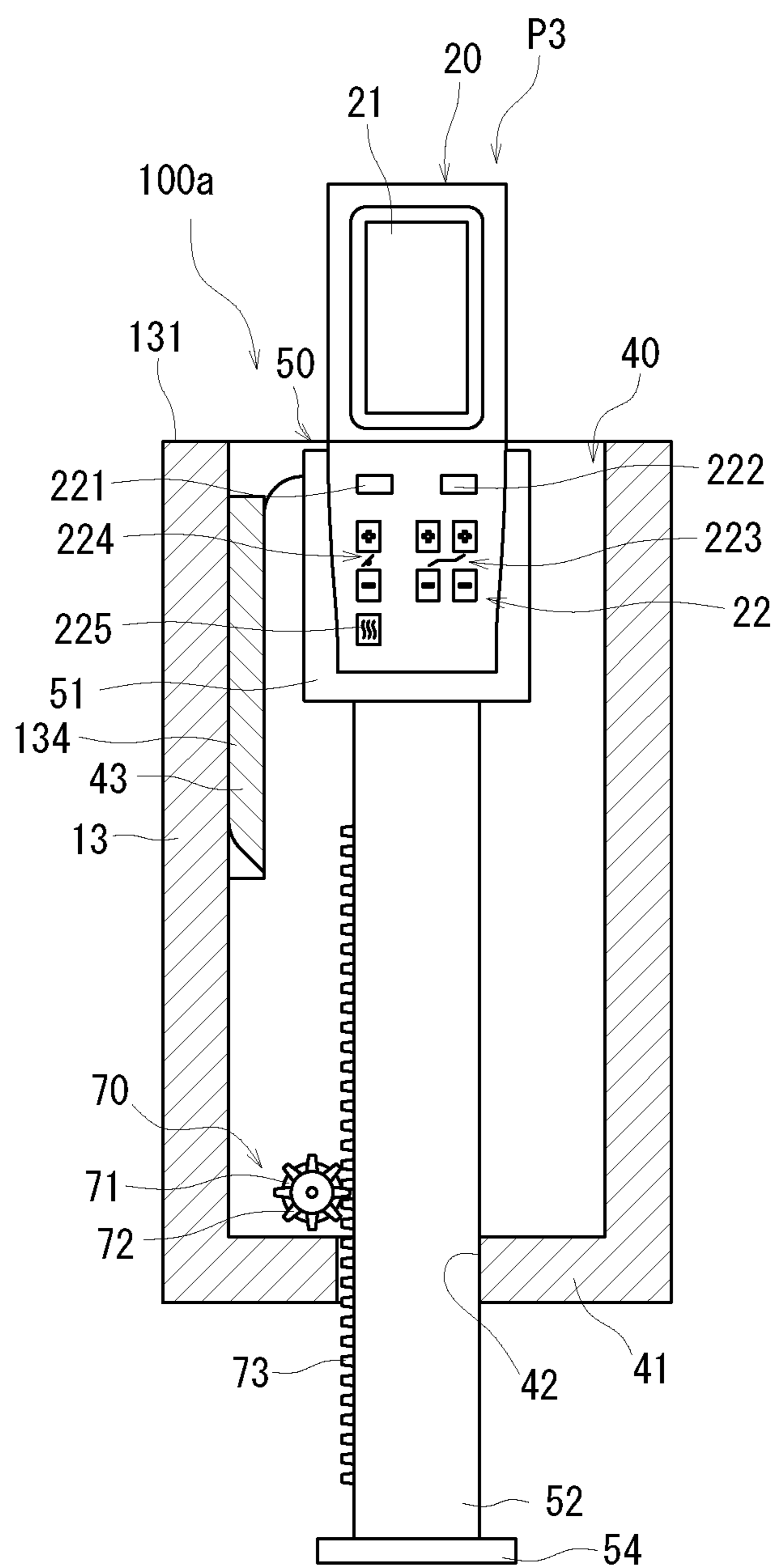


Fig. 11



1

CHAIR-TYPE MESSAGE MACHINE

RELATED APPLICATIONS

This application is based upon and claims the benefit of priority from the corresponding Japanese Patent Application No. 2019-121108 (filed on Jun. 28, 2019), the contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a chair-type massage machine capable of containing an operation unit.

Description of Related Art

JP 2017-140275 A discloses a chair-type massage machine which includes a pocket part capable of containing a remote control unit.

The chair-type massage machine described in JP 2017-140275 A, having a structure capable of containing a remote control unit, requires a person to be treated to grasp and draw out the remote control unit from the pocket part on occasions of use of the remote control unit. Thus, taking out the remote control unit is burdensome for the user.

SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is to provide a chair-type massage machine including an operation unit which, while out of use, is less obstructive for a person to be treated and which can be easily taken out on occasions of its use.

In order to achieve the above object, the present invention provides a chair-type massage machine including: a main body on which a person to be treated is to be seated; a first operation unit for accepting an input operation made by the person to be treated; a container recess formed in the main body and capable of containing the first operation unit; a holding part at least part of which is placed inside the container recess to hold the first operation unit; and a moving mechanism for moving the holding part. The holding part is reciprocatably movable between a first position in which at least part of the first operation unit is contained inside the container recess and a second position in which the first operation unit is exposed out of the container recess at a ratio larger than that of the first position. The chair-type massage machine further includes a second operation unit which is placed on the main body and which, based on an operation by the person to be treated, instructs the moving mechanism to execute movement of the holding part.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a chair-type massage machine according to the present invention;

FIG. 2 is a schematic sectional view showing a state in which a first operation unit is contained in a container recess;

FIG. 3 is a schematic sectional view showing a state in which the first operation unit is exposed outside from the container recess;

FIG. 4 is a view showing an operation of a second operation unit when a push button is pushed;

2

FIG. 5 is a view showing an operation of the second operation unit in setting the first operation unit into a first position;

FIG. 6 is a schematic sectional view showing a state in which the first operation unit is contained in the container recess;

FIG. 7 is a schematic block diagram of a chair-type massage machine shown in FIG. 6;

FIG. 8 is a flowchart showing operations of the chair-type massage machine;

FIG. 9 is a flowchart showing operations of a seating-linked sequential function;

FIG. 10 is a flowchart showing a reclining-linked sequential function; and

FIG. 11 is a view showing the first operation unit set in a third position.

DESCRIPTION OF EMBODIMENTS

Hereinbelow, embodiments of the present invention will be described with reference to the accompanying drawings. FIG. 1 is a perspective view of a chair-type massage machine 100 according to the present invention. FIG. 2 is a schematic sectional view showing a state in which a first operation unit 20 is contained in a container recess 40. FIG. 3 is a schematic sectional view showing a state in which the first operation unit 20 is exposed outside from the container recess 40. Although the first operation unit 20 is oriented frontward in FIGS. 2 and 3, yet this orientation is for an easier explanation and may be other than actual ones.

In the following description, positions and directions of the chair-type massage machine 100 and its configurational components may be indicated by 'left,' 'right,' 'up' and 'down.' These indications are on a basis of the chair-type massage machine 100 shown in FIG. 1. Moreover, these directions are congruous with directions viewed from the person to be treated seated on the chair-type massage machine 100.

<Chair-Type Massage Machine 100>

The chair-type massage machine 100 is to massage and relax (hereinafter, this operation will be referred to as treatment) the whole body of a person to be treated held on the massage machine. As shown in FIGS. 1 to 3, the chair-type massage machine 100 includes a main body 10, a first operation unit 20, a second operation unit 30, a container recess 40, a holding part 50, and a moving mechanism 60. In addition, an unshown cover is attached to the chair-type massage machine 100.

<Main Body 10>

The person to be treated is seated on the main body 10. The main body 10 includes a seat part 11, a backrest part 12, armrest parts 13, and a leg and foot treatment part 14. The seat part 11 holds buttocks and thighs of the person to be treated. The seat part 11 may include expansion/contraction portions for treating the buttocks or thighs. Each expansion/contraction portion includes, for example, a bag member (so-called air bag) which is enabled to repeat expansion and contraction by charging and discharging air. Hereinbelow, expansion/contraction portions to be used have a similar structure.

The backrest part 12 is placed in a rear of the seat part 11 and erectly provided upward of the seat part 11. As will be detailed later, the backrest part 12 includes a so-called reclining mechanism 101 having a function of tilting its upper portion rearward relative to the seat part 11. In addition, the reclining mechanism 101 includes a motor (not shown) for driving the backrest part 12.

The backrest part **12** includes a back treatment portion (not shown) for, while moving in the longitudinal direction, massaging the back of the person to be treated. The backrest part **12** may also include expansion/contraction portions for massaging shoulders and side part of upper-arm of the person to be treated held by the backrest part **12**.

The armrest parts **13** allow arms of the person to be treated seated on the seat part **11** to be rested thereon. The armrest parts **13** are placed so as to be paired on the left and right of the seat part **11**. The armrest parts **13** may include arm treatment portions for massaging the arms, i.e. fore-arms, wrists and fingers, of the person to be treated. Also, a container recess **40** in which the first operation unit **20** is contained is formed in an upper face **131** of one armrest part **13**. Details of the container recess **40** will be described later.

The leg and foot treatment part **14** is placed in front of the seat part **11** and vertically provided downward of the seat part **11**. The leg and foot treatment part **14** is so made up that lower end-side part of the leg and foot treatment part **14** is pivotable about an upper end of the leg and foot treatment part **14** serving as a fulcrum. The leg and foot treatment part **14** has an expansion/contraction portion for massaging both left-and-right calves and foot portions. Also, the leg and foot treatment part **14** may include a treatment portion (not shown) which turns in contact with soles to massage the soles. In addition, the leg and foot treatment part **14** may be such that lower end-side part is pivoted upward in linkage with the reclining mechanism of the backrest part **12**.

The chair-type massage machine **100** is enabled to fulfill massage-treatment of the whole body for the person to be treated by each of the treatment portions. Hereinafter, the each of the treatment portions may be referred to comprehensively as massage mechanism. The massage mechanism includes an unshown pump for pressure-feeding compressed air to expansion/contraction portions, an unshown actuator (e.g., motor) for operating the back treatment portion, and the like.

<First Operation Unit **20**>

The first operation unit **20** accepts an input operation by the person to be treated. In the chair-type massage machine **100**, the first operation unit **20** is a remote control unit. Details of the first operation unit **20** are explained below.

As shown in FIG. 2, the first operation unit **20** includes a display section **21** and an input section **22**. The display section **21** is a so-called touch panel-type display including a display panel and a touch sensing panel. The display section **21** displays a menu of plural items. Then, touching a menu item allows an input operation associated with the menu item to be fulfilled. Otherwise, it is also possible to display images (still images, motion images) upon request from the person to be treated.

The input section **22** includes a plurality of hardware buttons, so-called physical keys, that can be depressed by the person to be treated. The physical keys of the input section **22** include a power key **221**, an emergency stop key **222**, a posture control key **223**, a back treatment portion positioning key **224**, a heater key **225**, and the like.

In the first operation unit **20**, for example, setting by the touch panel of the display section **21** is used primarily to make input of settings before treatment, and setting by the input section **22** is used primarily to make control of settings during treatment.

An unshown cable is connected to the first operation unit **20**. The first operation unit **20** is supplied with electric power via the cable. Also, the first operation unit **20** transmits signals via the cable to the reclining mechanism, the massage mechanism, and the like. Although the reclining

mechanism and the massage mechanism are to be operated directly from the first operation unit **20** in this embodiment, yet this is not limited to. A control unit may be provided independent of the first operation unit **20**.

As described above, the first operation unit **20** is used by the person to be treated to make settings of treatment contents before treatment. On the other hand, there is a fear that the first operation unit **20** may be obstructive when the person to be treated is seated on the main body **10** or when the person to be treated leaves the main body **10**. For this reason, in the chair-type massage machine **100** according to this embodiment, the first operation unit **20** is to be contained in the container recess **40** while out of use by the person to be treated, i.e., while not needed by the person to be treated.

The container recess **40** is a recessed space which is recessed downward from the upper face **131** of an armrest part **13**. The container recess **40** allows the first operation unit **20** to be inserted inside thereof. Besides, the holding part **50** and part of the moving mechanism **60**, in addition to the first operation unit **20**, are to be inserted into the container recess **40**.

The holding part **50** holds the first operation unit **20**. The holding part **50** includes a holding frame portion **51** and a guide pole portion **52**. The holding frame portion **51** grasps and holds the first operation unit **20**. In addition, the first operation unit **20** may be provided separable from the holding frame portion **51** or formed integrally with the holding frame portion **51**.

At least part of the holding part **50** is placed inside the container recess **40**. The holding part **50** is reciprocable between a first position **P1** (see FIG. 2) in which the first operation unit **20** is contained inside the container recess **40** and a second position (see FIG. 3) in which the first operation unit **20** is exposed.

Although the first position **P1** is set to a position in which the first operation unit **20** is fully contained in the container recess **40** in this embodiment, yet this is not limited to. The first position **P1** may be such that the first operation unit **20** is protruded from the container recess **40** to such an extent as to be less obstructive when the person to be treated is seated on the seat part **11** or when the person to be treated leaves the seat part **11**. Further, although the second position **P2** is set to a position in which the first operation unit **20** is fully exposed, yet this is not limited to. The second position **P2** needs only to be a position that allows the person to be treated to make input operation, and the first operation unit **20** may be contained only partly inside the container recess **40**. That is, the first position **P1** is a position in which at least part of the first operation unit **20** is contained inside the container recess **40**, and the second position **P2** is a position in which the first operation unit **20** is exposed out of the container recess **40** at a ratio larger than that of the first position **P1**.

The holding frame portion **51** is moved linearly up and down inside the container recess **40**. The guide pole portion **52** is a pole-shaped member extending downward from a lower face of the holding frame portion **51**. The guide pole portion **52** is inserted into a guide hole **42** formed in a bottom plate portion **41** of the container recess **40**. The guide pole portion **52** is movable up and down along the guide hole **42**. An anti-leaving portion **54** larger than the guide hole **42** is provided at a lower end of the guide pole portion **52**. When the holding part **50** is moved upward, the anti-leaving portion **54** is brought into contact with a marginal edge portion of the guide hole **42**, by which the guide pole portion **52** is restricted in movement.

5

Further, a spring receiver **53** is provided at a site where the guide pole portion **52** connects with the holding frame portion **51**, i.e., at a site lower than an upper end of the guide pole portion **52**. The spring receiver **53**, with which an end of a spring **61** of the moving mechanism **60** is put into contact, is subject to elastic force of the spring **61**.

The moving mechanism **60** performs movement of the holding part **50**. The moving mechanism **60** is placed inside the container recess **40**. The moving mechanism **60** includes the spring **61** as an elastic member. The moving mechanism **60** is not limited to the spring **61** and may be, for example, an air spring or others selected from a wide range of members that can bias the holding part **50** upward. The spring **61** is placed so as to surround the guide pole portion **52**. The spring **61** is so placed that its one end is in contact with a bottom plate portion **41** of the container recess **40** while the other end is in contact with the spring receiver **53**.

While the holding part **50** is in the first position **P1**, the spring **61** is compressed so as to be shorter than its equilibrium length. Therefore, while the holding part **50** is in the first position **P1**, the spring **61** biases the holding part **50** upward with the elastic force. Also while the holding part **50** is in the second position **P2**, the spring **61** is compressed so as to be shorter than its equilibrium length. As a result, also while being in the second position **P2**, the holding part **50** is pushed upward with biasing force of the spring **61**. By this biasing force, the holding part **50** is stopped at the second position **P2**. In addition, at least one of the holding part **50**, the moving mechanism **60** or the container recess **40** may include a mechanism for restricting downward movement of the holding part **50** being in the second position **P2**.

The moving mechanism **60** may include deceleration part (not shown) for restricting moving speed of the holding part **50**. The deceleration part may be implemented, for example, by using a member which is to be put into contact with the guide pole portion **52** to restrict the moving speed of the holding part **50** by friction, or fitting a damper or other like member which increases in resistance against the speed. Further, instead of providing the deceleration part, the moving speed of the holding part **50** may be adjusted by adjusting the spring constant and equilibrium length of the spring **61**.

The moving mechanism **60** is activated based on an operation of the second operation unit **30**. An explanation of the second operation unit **30** is given below. As shown in FIGS. **2** and **3**, the second operation unit **30** includes a push button **31**, a slider lock **32**, a pivotal shaft **33**, a link portion **34**, a torsion spring **35**, and a pin **36**.

The push button **31** is slidably provided in a button hole **132** which is a through hole formed in a side face on one side of an armrest part **13** closer to the seat part **11**. That is, the push button **31** is formed on the seat part **11** side of the armrest part **13**, but not limited to this. The push button **31** may be provided on one side of an armrest part **13** opposite to the seat part **11** side, as an example.

The push button **31** is formed into a columnar shape whose axial both ends are larger in diameter than its central portion. As a result, the push button **31** is prevented from leaving the button hole **132** both inward and outward of the container recess **40**. Also, the push button **31** is spherical-shaped on one side facing the inside of the container recess **40**. Accordingly, every time the push button **31** pushes the link portion **34**, it is always part of the sphere which makes contact with the link portion **34**, so that stress is less likely to concentrate to a contact spot. In addition, although the push button **31** is formed into a columnar shape in this embodiment, yet this is not limited to. For example, the push

6

button **31** may be formed into a rectangular-parallelepiped shape, in which one end on one side facing the inside of the container recess **40** is formed into a curved surface curved toward a direction in which the link portion **34** extends.

The slider lock **32** is slidably inserted into a sliding recess **133** recessed outward from an inner circumferential surface of the container recess **40**. At an end portion of the slider lock **32**, a sloped surface **321** is formed so as to extend increasingly downward toward the end. The slider lock **32** has its lower face put into contact with the spring receiver **53** of the holding part **50**. That is, the slider lock **32** restricts upward movement of the holding part **50**.

The pivotal shaft **33** is a center axis serving as a pivotal center of the link portion **34**. The pivotal shaft **33** may be formed integrally with the link portion **34** or formed through the link portion **34** so as to pivotably hold the link portion **34**. The link portion **34** is pivotably held via the pivotal shaft **33** on the container recess **40**. The link portion **34** transfers a displacement (force) resulting from a push of the push button **31** to the slider lock **32**. Lower part of the link portion **34** is contactable with the push button **31**. Further, upper part of the link portion **34** is connected via the pin **36** to the slider lock **32**. In addition, in a case where the makeup of the link portion **34** is partly altered so that the slider lock **32** can be operated by handling of the push button **31**, the push button **31** may also be provided on the upper face of an armrest part **13**.

The pin **36** is attached to the slider lock **32** and extends in a direction perpendicular to both a moving direction of the holding part **50** and a sliding direction of the slider lock **32**. The link portion **34** has an elongated pin hole, and the pin **36** is movably set in the pin hole. Insertion of the pin **36** into the elongated pin hole makes it possible to absorb differences in distance from the center of the pivotal shaft **33** due to sliding of the slider lock **32**. As a result, as the link portion **34** is pivoted about the pivotal shaft **33**, the slider lock **32** can be slid along the sliding recess **133** via the pin **36**.

The torsion spring **35** is wound on the pivotal shaft **33**. By the torsion spring **35**, the link portion **34** is biased in such a direction that its upper part on the upper side of the pivotal shaft **33** approaches the holding part **50**. Then, the link portion **34** is stopped by making contact with an end of the push button **31**. As a result, the push button **31** can be maintained in a protruded state, and the slider lock **32** can be set to such a position as to restrict movement of the spring receiver **53**. The chair-type massage machine **100** has a configuration described hereinabove.

The second operation unit **30** described above is only an example and not limited to this case. For example, it is allowable that the push button **31** directly operates the slider lock **32** while the link portion is omitted, or that the push button **31** itself serves also as the slider lock. Moreover, the push button **31** is not limited in its location unless incapable of operating the moving mechanism **60**.

<Operations of First Operation Unit **20**>

Next, a protruding operation of the first operation unit **20** from the container recess **40** as well as its inserting operation into the container recess **40** in the chair-type massage machine **100** according to this embodiment will be described with reference to the drawings. FIG. **4** is a view showing an operation of the second operation unit **30** when the push button **31** is pushed. FIG. **5** is a view showing an operation of the second operation unit **30** when the holding part **50** is moved down so as to be contained in the first position **P1**.

While the holding part **50** is in the first position **P1**, an upper part of the link portion **34** on the upper side of the pivotal shaft **33** is pushed by the torsion spring **35** toward the

7

center of the container recess 40. A resultant displacement (force) of the link portion 34 is transferred to the slider lock 32 via the pin 36. The slider lock 32 is moved and biased toward the center of the container recess 40. As a result, the lower face of the slider lock 32 is brought into contact with an upper face of the spring receiver 53 of the holding part 50, so that upward movement of the holding part 50 is restricted. In addition, since a direction of force acting from the spring 61 onto the holding part 50 and a movable direction of the slider lock 32 differ from each other, the slider lock 32 is less likely to be pushed into the sliding recess 133 by the force of the spring 61. Therefore, the slider lock 32 is enabled to restrict the movement of the holding part 50.

As shown in FIG. 4, when the part of the push button 31 protruded outside of the armrest part 13 is pushed by the person to be treated, the push button 31 is pushed inside of the container recess 40. Then, lower part of the link portion 34 is pushed by the push button 31, so that the link portion 34 is pivoted about the pivotal shaft 33. By this pivoting of the link portion 34, the slider lock 32 connected to the link portion 34 via the pin 36 is moved inside of the sliding recess 133.

By the slider lock 32 being moved inside of the sliding recess 133, the slider lock 32 is separated from the upper face of the spring receiver 53. As a result, the movement restriction for the holding part 50 by the slider lock 32 is released, so that the holding part 50 is moved from the first position P1 to the second position P2 by elastic force of the spring 61 in the moving mechanism 60.

The person to be treated is allowed to move the holding part 50 from the second position P2 to the first position P1 by depressing the first operation unit 20 held on the holding part 50 with a force larger than the elastic force of the spring 61.

As shown in FIG. 5, when the holding part 50 has got close to the first position P1, an edge portion of the spring receiver 53 is brought into contact with the sloped surface 321 of the slider lock 32. As the holding part 50 is moved further downward, the sloped surface 321 is pushed by the edge portion of the spring receiver 53, with the slider lock 32 moved into the sliding recess 133. Then, when the holding part 50 has reached the first position P1, the spring receiver 53 is moved to under the slider lock 32. The slider lock 32, which has been pushed by the spring receiver 53 against the sliding recess 133, is returned to the original position by the force of the torsion spring 35, overlapping with upper part of the spring receiver 53. As a result, upward movement of the holding part 50 is restricted.

As described above, in the chair-type massage machine 100 according to this embodiment, the first operation unit 20 can be contained inside the container recess 40. By the first operation unit 20 being contained in the container recess 40, the first operation unit 20 is not obstructive when the person to be treated is seated on the main body 10. Also, as the person to be treated seated on the main body 10 operates the push button 31 of the second operation unit 30, the holding part 50 is moved from the first position P1 to the second position P2. As a result of this, the first operation unit 20 is protruded upward of the upper face 131 of the armrest part 13. Thus, the person to be treated becomes ready to operate the first operation unit 20.

Also, after ending the operation of the first operation unit 20, the person to be treated is allowed to push down the first operation unit 20 or the holding part 50 holding the first operation unit 20 so that the holding part 50 can be moved to the first position P1 and moreover fixed at the first position P1. The first operation unit 20 is maintained con-

8

tained inside the container recess 40. After an end of the treatment, the person to be treated sets the first operation unit 20 contained in the container recess 40, so that the first operation unit 20 is not obstructive when the person to be treated leaves the main body 10.

As described above, the person to be treated is allowed to easily take out the first operation unit 20 from the container recess 40, as required, with simplicity. Also, the first operation unit 20, when unnecessary, can be contained in the container recess 40. Thus, the first operation unit 20 is less obstructive when the person to be treated is seated on the main body 10 or leaves the main body 10. As a result of these, it is achievable to increase convenience to the person to be treated.

Second Embodiment

Another embodiment of the chair-type massage machine according to the present invention will be described with reference to the drawings. FIG. 6 is a schematic sectional view showing a state in which the first operation unit 20 is contained in the container recess 40. FIG. 7 is a schematic block diagram of a chair-type massage machine 100a according to a second embodiment. The chair-type massage machine 100a of the second embodiment differs from the chair-type massage machine 100 both in that a second operation unit 30a and a moving mechanism 70 are different from those of the chair-type massage machine 100 and in that the chair-type massage machine 100a includes a lid portion 134, a rail portion 43 and a detection unit 80. A controller 200, which is omitted in the drawings in the first embodiment, is also shown in the figure. Substantially like components of the chair-type massage machine 100a in conjunction with the chair-type massage machine 100 are designated by like reference signs, and detailed description of those like components is omitted.

In the chair-type massage machine 100a, as shown in FIG. 7, all of the first operation unit 20, the second operation unit 30a, the moving mechanism 70, the detection unit 80, a reclining mechanism 101, and a moving mechanism 102 are connected to the controller 200.

The controller 200 controls operations of each of the units and mechanism of the chair-type massage machine 100a. The controller 200 includes a computer unit having an arithmetic processing circuit such as a CPU or an exclusive processor or the like. The controller 200 may be such that the circuit itself performs arithmetic operations or that control programs stored in an unshown storage unit are read and executed. The storage unit may be formed of a memory circuit, in which personal information and discrete settings and other information as to person to be treated may be stored in addition to the foregoing control programs.

In addition, although the controller 200 is described as a member independent of the first operation unit 20 in this embodiment, yet this is not limited to. For example, the first operation unit 20 may serve also as the controller 200.

The second operation unit 30a includes a circuit enabled to deliver a signal to the controller 200 when operated. For example, the second operation unit 30a may be one which includes a pushbutton switch and which delivers a signal to the controller 200 when the pushbutton switch is pushed. The second operation unit 30a may also be other than this. The second operation unit 30a is set to such a position as to be operable for the person to be treated seated on the main body 10. In addition, the second operation unit 30a may be so designed as to serve also as the controller 200.

The reclining mechanism **101** and the massage mechanism **102** receive control signals from the controller **200** to operate according to the control signals. In addition, without being limited to this, a first operation unit **20** may transmit control signals directly.

The detection unit **80** includes a detection sensor for detecting that the person to be treated has been seated, or is seated, on the main body **10**. The detection sensor may be, for example, a pressure sensor, an optical sensor, an infrared sensor, or the like. Other than these, a wide range of sensors capable of detecting the seating of the person to be treated may be adopted.

<Moving Mechanism 70>

The moving mechanism **70** will be described in detail below. As shown in FIGS. **6** and **7**, the moving mechanism **70** includes a motor **71**, a pinion gear **72**, and a rack gear **73**. The motor **71** is an electric motor, which is an example of the electric actuator. Instead of the motor, a wide range of devices capable of electrically outputting motive power may be adopted. The pinion gear **72** is fixed to an output shaft of the motor **71**. The pinion gear **72** is rotated by rotation of the output shaft of the motor **71**. The rack gear **73**, having gear teeth arrayed in linear shape, is fitted to an outer surface of the guide pole portion **52** in the holding part **50**.

The pinion gear **72** is meshed with the rack gear **73** so that the pinion gear **72** and the rack gear **73** transform rotational motion of the motor **71** into linear motion of the holding part **50**. That is, rotational power of the motor **71** is transmitted via the pinion gear **72** and the rack gear **73** as power for moving the holding part **50** in an up-and-down direction. In addition, the moving mechanism **70** may include a mechanism for restricting movement of the holding part **50**, such as a break mechanism. The break mechanism allows the holding part **50** to maintain in position even with power feed to the motor **71** cut off.

The chair-type massage machine **100a** includes a lid portion **134** which is opened and closed by an unshown drive mechanism of the moving mechanism **70**. In addition, the lid portion **134** may be opened and closed by being pushed or pulled by the holding part **50** during movement of the holding part **50**. The container recess **40** has a rail portion **43** for guiding the opened lid portion **134** inside the container recess **40**. The lid portion **134**, after opening the container recess **40**, is moved along the rail portion **43** so as to be contained inside the container recess **40**. By the lid portion **134**, falls of coins or other small articles into the container recess **40** can be suppressed.

<Operations of Chair-Type Massage Machine 100a>

Operations of the above-described chair-type massage machine **100a** will be described with reference to the accompanying drawings. FIG. **8** is a flowchart showing operations of the chair-type massage machine **100a**. It is noted that the flowchart shown in FIG. **8** shows operations in which the person to be treated handles the second operation unit **30a** after the person to be treated is seated.

First, the controller **200** stands by until the second operation unit **30a** is operated (step **S101** is repeated until a Yes is replied at step **S101**). When the second operation unit **30a** is operated (Yes at step **S101**), the controller **200** drives the motor **71** of the moving mechanism **70** to move the holding part **50** to the second position **P2** (step **S102**). It is noted that before moving the holding part **50**, the moving mechanism **70** opens the lid portion **134**. While the holding part **50** is in the second position **P2**, the first operation unit **20** is exposed upward of the armrest part **13**. In this state, the person to be treated performs an input operation on the first operation unit **20**.

The controller **200** stands by until the input operation on the first operation unit **20** is completed (step **S103** is repeated until a Yes is replied at step **S103**). The input operation on the first operation unit **20** may be one which is decided as an operation completion upon detection that a specific operation has been performed, e.g., a specific button such as a start button (not shown) or a completion button (not shown) displayed on the touch panel of the display section **21** has been operated. The input operation completion may be detected other than these.

When the input operation on the first operation unit **20** is completed (Yes at step **S103**), the controller **200** drives the motor **71** to move the holding part **50** to the first position **P1** (step **S104**). After the holding part **50** is set to the first position **P1**, the moving mechanism **70** closes the lid portion **134**. Then, the controller **200** instructs the reclining mechanism **101** and the massage mechanism **102** to start massage treatment (step **S105**).

The controller **200** checks whether or not the treatment has been completed (step **S106**). The completion of treatment may be recognized when programs set by the first operation unit **20** have been fully processed, or when a set time has elapsed, or the like, but these are not limited to.

In some cases, the person to be treated may desire to operate the reclining mechanism **101**, the heater or the like even during the execution of the treatment. Therefore, the chair-type massage machine **100a** is enabled to move the holding part **50** to the second position **P2** during the treatment.

With the treatment incomplete (No at step **S106**), the controller **200** checks whether or not the second operation unit **30a** has been operated (step **S107**). When it is not ascertained that the second operation unit **30a** has been operated (No at step **S107**), the controller **200** repeats the checking as to completion of the treatment (returns to step **S106**). When it is ascertained that the second operation unit **30a** has been operated (Yes at step **S107**), the controller **200** checks whether or not the holding part **50** is in the second position **P2** (step **S108**).

When the holding part **50** is in the second position **P2** (Yes at step **S108**), the controller **200** drives the motor **71** to move the holding part **50** to the first position **P1** (step **S109**), then repeating the checking as to completion of the treatment (returns to step **S106**). When the holding part **50** is not in the second position **P2** (No at step **S108**), the controller **200** drives the motor **71** to move the holding part **50** to the second position **P2** (step **S110**), then repeating the checking as to completion of the treatment (returns to step **S106**).

When a completion of the treatment is ascertained (Yes at step **S106**), the controller **200** checks whether or not the holding part **50** is other than in the first position **P1** (step **S111**). When the holding part **50** is other than in the first position **P1** (Yes at step **S111**), the controller **200** drives the motor **71** to move the holding part **50** to the first position **P1** (step **S112**), where the processing flow is ended. Meanwhile, when the holding part **50** is in the first position **P1** (No at step **S111**), the processing flow is ended.

As described above, the person to be treated is allowed to easily take out the first operation unit **20** from the container recess **40**, as required, with simple operation. Also, the first operation unit **20**, when unnecessary, can be contained in the container recess **40**. Thus, the first operation unit **20** is less obstructive when the person to be treated is seated on the main body **10** or leaves the main body **10**. As a result of these, it is achievable to increase convenience to the person to be treated.

11

Moreover, even during the treatment, the person to be treated is allowed to operate the first operation unit **20** with simplicity. The second operation unit **30a** is a signal-transmitting electrical device and therefore has a high degree of freedom for installation. It is also allowable to provide the second operation unit **30a** in plurality.

<First Modification>

The chair-type massage machine **100a** includes the detection unit **80**. Therefore, the moving mechanism **70** is enabled to have a seating-linked sequential function of detecting a seating of the person to be treated and subsequently operating the holding part **50** in linkage by exploiting the detection unit **80**. The seating-linked sequential function is explained below with reference to the drawings. FIG. **9** is a flowchart showing operations of the seating-linked sequential function. The flowchart shown in FIG. **9** is substituted for step **S101** in the flowchart of FIG. **8**. Only the seating-linked sequential function will be described for the explanation of the first modification.

As shown in FIG. **9**, the controller **200** stands by until a seating is detected (**S201** is repeated until a Yes is replied at step **S201**). When a seating is detected (Yes at step **S201**), the controller **200** checks whether or not the seating-linked sequential function is ON (step **S202**). When the seating-linked sequential function is not ON (No at step **S202**), the controller **200** checks whether or not the second operation unit **30a** has been operated (step **S203**). When no operation of the second operation unit **30a** is ascertained (No at step **S203**), the controller **200** returns to the checking as to whether or not the seating-linked sequential function is ON (returns to step **S202**).

When the seating-linked sequential function is ON (Yes at step **S202**) or when it is ascertained that the second operation unit **30a** has been operated (Yes at step **S203**), the controller **200** instructs the motor **71** to move the holding part **50** to the second position **P2** (step **S102** in FIG. **8**). Following operations are similar to those shown in FIG. **8** and so omitted.

When the person to be treated is seated, the first operation unit **20** automatically gets outside of the container recess **40** by the seating-linked sequential function. Accordingly, there is no need for operating the second operation unit **30a**, making it possible to increase convenience to the person to be treated. Further, since the first operation unit **20** gets outside even with the position of the second operation unit **30a** unknown, making it possible to increase convenience to the person to be treated. In addition, the person to be treated may be notified of the position of the second operation unit **30a** during a first input operation to the first operation unit **20**.

Although this embodiment has been described above on an example in which the seating-linked sequential function turns ON or OFF, yet the seating-linked sequential function may be set so as to be normally operating.

<Second Modification>

In the chair-type massage machine **100a**, the moving mechanism **70** has a reclining-linked sequential function of moving the holding part **50** in linkage with the reclining mechanism **101**. FIG. **10** is a flowchart showing the reclining-linked sequential function. The reclining mechanism **101** is operable independently of operation of the massage mechanism **102**. That is, the reclining-linked sequential function is an interrupt operation which is executable to some degree of freedom during operations of the chair-type massage machine **100a**.

As shown in FIG. **10**, the controller **200** stands by until an operation start of the reclining mechanism **101** is ascertained (step **S301** is repeated until a Yes is replied at step **S301**).

12

When an operation start of the reclining mechanism **101** is ascertained (Yes at step **S301**), the controller **200** checks whether or not the reclining-linked sequential function is ON (step **S302**). When the reclining-linked sequential function is not ON (No at step **S302**), the processing flow is ended.

When the reclining-linked sequential function is ON (Yes at step **S302**), the controller **200** checks whether or not a motion of the reclining mechanism **101** is a transition from a sitting position to a lying position (step **S303**). When the motion of the reclining mechanism **101** is one from the sitting position to the lying position (Yes at step **S303**), the controller **200** checks whether or not the holding part **50** is other than in the second position **P2** (step **S304**).

When the holding part **50** is other than in the second position **P2** (Yes at step **S304**), the controller **200** instructs the motor **71** to operate so as to make the holding part **50** moved to the second position **P2** (step **S305**), then ending the processing flow. When the holding part **50** is in the second position **P2** (No at step **S304**), the processing flow is ended.

When the motion of the reclining mechanism **101** is a transition from the lying position to the sitting position (No at step **S303**), the controller **200** checks whether or not the holding part **50** is other than in the first position **P1** (step **S306**).

When the holding part **50** is other than in the first position **P1** (Yes at step **S306**), the controller **200** instructs the motor **71** to operate so as to make the holding part **50** moved to the first position **P1** (step **S307**), then ending the processing flow. When the holding part **50** is in the first position **P1** (No at step **S306**), the processing flow is ended.

As described above, the moving mechanism **70** operates the holding part **50** in linkage with the motion of the reclining mechanism **101** in order that the first operation unit **20** is drawn out or contained in. As a result, it becomes possible to increase convenience to the person to be treated. Although the reclining-linked sequential function is turned ON or OFF in the chair-type massage machine **100a** of this modification, yet this is not limited to, and the reclining-linked sequential function may be set so as to be normally functioning.

For example, the person to be treated leaves the state of the sitting position to outside of the main body **10**. Therefore, while the person to be treated is in the sitting position, the first operation unit **20** is more likely to be obstructive. For this reason, the first operation unit **20** is contained in the container recess **40** while the person to be treated is in the sitting position. Meanwhile, the person to be treated seldom leaves the state of the lying position to outside of the main body **10**. In some cases, the person to be treated may desire to make an input operation for changing the posture or prolonging the treatment or the like. Accordingly, while the person to be treated is in the lying position, the chair-type massage machine **100a** sets the first operation unit **20** exposed outside. This operation, in the chair-type massage machine **100a**, is automatically implementable by the reclining-linked sequential function. As a result, this can increase convenience to the person to be treated.

In addition, for example, the reclining-linked sequential function may be linked with reclining operations subsequent to the treatment start (step **S105**) in the flowchart of FIG. **8**. The first operation unit **20** can be automatically drawn outside in linkage with the motion of the reclining mechanism **101** even when the person to be treated has operated the reclining mechanism **101** alone on the way of treatment.

13

<Third Modification>

FIG. 11 is a view showing the first operation unit 20 positioned in a third position P3. With the chair-type massage machine 100a, the person to be treated, while in the lying position, may desire to check only images displayed on the display section 21 of the first operation unit 20. The images may include motion images, still images and the like. Also, the images may include a changeover key for changing over playing operation involved in playing music as an example. Like this, a desirable state may be that only at least part of the display section 21 is exposed outside of the container recess 40.

Accordingly, as shown in FIG. 11, the controller 200 may control the motor 71 so that the holding part 50 can be stopped at a third position P3 between the first position P1 and the second position P2. For example, the holding part 50 may be stopped at a predetermined third position P3 while being moved between the first position P1 and the second position P2. Further, the holding part 50 may also be stopped upon acceptance of an operation input from the person to be treated to the second operation unit 30a. In this case, the person to be treated may be enabled to stop the holding part 50 at a third position P3 that is an arbitrary site designated by the person to be treated.

In each of above described embodiment, it is assumed that the container recess 40 is placed in the upper face of an armrest part 13, yet this is not limited to. The placement site of the container recess 40 may be selected from a wide range of positions, such as a frontage of a lateral portion of the backrest part 12, that allow the person to be treated to easily operate the first operation unit 20.

The present invention is applicable to chair-type massage machines for kneading and relaxing the body of a person to be treated.

While the foregoing has described the embodiment of the present invention, the present invention is not limited thereto. Furthermore, the embodiment of the present invention can be implemented by adding various modifications thereto without departing from the spirit of the invention.

In order to achieve the above object, the present invention provides a chair-type massage machine 100 (100a) including: a main body 10 on which a person to be treated is to be seated; a first operation unit 20 for accepting an input operation made by the person to be treated; a container recess 40 formed in the main body 10 and capable of containing the first operation unit 20; a holding part 50 at least part of which is placed inside the container recess 40 to hold the first operation unit 20; and a moving mechanism 60 (70) for moving the holding part 50. The holding part 50 is reciprocally movable between a first position P1 in which at least part of the first operation unit 20 is contained inside the container recess 40 and a second position P2 in which the first operation unit 20 is exposed out of the container recess 40 at a ratio larger than that of the first position P1. The chair-type massage machine 100 (100a) further includes a second operation unit 30 (30a) which is placed on the main body 10 and which, based on an operation by the person to be treated, instructs the moving mechanism 60 (70) to execute movement of the holding part 50.

In the above-described chair-type massage machine 100, the moving mechanism 60 includes a biasing part 61 placed in the container recess 40 to bias the holding part 50 in a direction directed from the first position P1 toward the second position P2. The second operation unit 30 includes a lock part 32 placed in the container recess 40 to restrict movement of the holding part 50 set in the first position P1.

14

When the second operation unit 30 is operated, the lock part 32 may derestrict movement of the holding part 50.

In the above-described chair-type massage machine 100, the moving mechanism 70 may include an electric actuator 71 enabled to reciprocally move the holding part 50 between the first position P1 and the second position P2; and when the second operation unit 30a is operated, the moving mechanism 70 may either move the holding part 50, which is in the first position P1, to the second position P2, or move the holding part 50, which is in the second position P2, to the first position P1.

The above-described chair-type massage machine 100 may further include a detection unit 80 for detecting a seating of the person to be treated, wherein the moving mechanism 70 may move the holding part 50 to the second position P2 when the detection unit 80 detects a seating of the person to be treated.

In the above-described chair-type massage machine 100, the main body 10 with the person to be treated seated thereon may be changeable between a sitting position in which an upper-half body of the person to be treated is raised up and a lying position in which the upper-half body of the person to be treated is tilted backward, and the moving mechanism 70 may move the holding part 50 toward the second position P2 for a transition of the main body 10 from the sitting position to the lying position, and move the holding part 50 toward the first position P1 for a transition of the main body 10 to the sitting position.

In the above-described chair-type massage machine 100, the moving mechanism 70 may stop the holding part 50 at a third position P3 which is an intermediate position between the first position P1 and the second position P2.

In the above-described chair-type massage machine 100 (100a), the main body 100 may include: an armrest part 13 which is placed beside a seat part 11 for holding a waist of the person to be treated and which is enabled to hold a forearm of the person to be treated, and a backrest part 12 for holding an upper-half body of the person to be treated, wherein the container recess 40 may be formed either in an upper face 131 of the armrest part 13 or in a front face of a lateral portion of the backrest part 12.

What is claimed is:

1. A chair-type massage machine comprising:

- a main body on which a person to be treated is to be seated;
 - a first operation unit for accepting an input operation made by the person to be treated;
 - a container recess formed in the main body and capable of containing the first operation unit;
 - a holding part at least part of which is placed inside the container recess to hold the first operation unit;
 - a moving mechanism for moving the holding part; and
 - a second operation unit which is placed on the main body and which, based on an operation by the person to be treated, instructs the moving mechanism to execute movement of the holding part, wherein
- the holding part is reciprocally movable by the moving mechanism between a first position in which at least part of the first operation unit is contained inside the container recess and a second position in which the first operation unit is exposed out of the container recess at a ratio larger than that of the first position;
- the moving mechanism includes an electric actuator enabled to reciprocally move the holding part between the first position and the second position, and
- when the second operation unit is operated, the moving mechanism either moves the holding part, which is in

15

the first position, to the second position, or moves the holding part, which is in the second position, to the first position.

2. The chair-type massage machine according to claim 1, further comprising

a detection unit for detecting a seating of the person to be treated, wherein

the moving mechanism is enabled to move the holding part to the second position when the detection unit detects a seating of the person to be treated.

3. The chair-type massage machine according to claim 1, wherein

the main body with the person to be treated seated thereon is changeable between a sitting position in which an upper-half body of the person to be treated is raised up and a lying position in which the upper-half body of the person to be treated is tilted backward, and

the moving mechanism is enabled to move the holding part toward the second position for a transition of the main body from the sitting position to the lying posi-

16

tion, and to move the holding part toward the first position for a transition of the main body to the sitting position.

4. The chair-type massage machine according to claim 1, wherein

the moving mechanism stops the holding part at a third position which is an intermediate position between the first position and the second position.

5. The chair-type massage machine according to claim 1, wherein

the main body includes:

an armrest part which is placed beside a seat part for holding buttocks and thighs of the person to be treated and which is enabled to hold a forearm of the person to be treated, and

a backrest part for holding an upper-half body of the person to be treated,

wherein the container recess is formed either in an upper face of the armrest part or in a front face of a lateral portion of the backrest part.

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